



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/589,898

08/18/2006

Yukihiko Nakasaka

129122

2477

25944 7590 02/22/2010
OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER

VILAKAZI, SIZO BINDA

ART UNIT

PAPER NUMBER

3747

NOTIFICATION DATE

DELIVERY MODE

02/22/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com
jarmstrong@oliff.com

Office Action Summary	Application No. 10/589,898	Applicant(s) NAKASAKA, YUKIHIRO	
	Examiner SIZO B. VILAKAZI	Art Unit 3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Amendments and Applicant arguments submitted on 12/09/2009 have been received and its contents have been carefully considered.

Claims 1-19 are cancelled.

Claims 20-28 are presented for examination.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. In regards to the above listed claims the applicant claims that the injection amount control means "increases or decreases the fuel injection amount from the injection amount for stoichiometric operation by a predetermined amount *at a frequency outside the range of human perception*". This statement is indefinite, as there is no teaching within the claims or the specification as to exactly what frequency would be outside the range of human perception. The examiner further submits that "the range of human perception" would vary from person to person not only based on individual differences (different levels of hearing, motion perception, etc.), but on what a person

Art Unit: 3747

may be doing at the time within the cabin of the car, so it is questionable whether a specific frequency may be within the range of one persons perception while being outside of the range of perception of another person. "Human perception" is a variable value, and thus unless a defined limit to the frequency can be established (Example: X amount of cycles per second), this limitation is considered to be indefinite and is thus given no patentable weight.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 20-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shomura (US Patent No. 6,170,465 B1) in view of Ishikawa et al. (US Patent No. 6,975,934 B2), Mashiki (US Patent No. 6,176,220 B1) and Sugiyama et al. (US Patent 6,792,901 B2).

4. In Re claims 20-25, Shomura discloses

a. An injection amount control means for changing a fuel injection amount for a particular one of the cylinders from an injection amount for stoichiometric operation to either an increased amount or a decreased amount (Column 7, Lines 36-43 and Lines 54-62, Column 10, Lines 61-67)

Art Unit: 3747

- b. A computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the injection amount control means (Column 7, Lines 54-62 and Column 8, Lines 10-14)
 - c. that the various detected values detected by the various sensors, or the values stored in the control unit could be output to the vehicle's tachometer or other such device (Column 14, Lines 38-67)
 - d. that the rotation speed change is stored in the control unit (Column 10, Lines 17-22), therefore it is a value capable of being output
5. Shomura does not disclose output means for outputting the torque or rotation speed change amount determined by the computation means as an index value that indicates the degree of intake air amount variation in the particular cylinder.
6. However, Ishikawa et al. acknowledge that the variation in air intake amount can be detected or corrected based on the engine torque or rotational speed variation resulting from a change in fuel injection amount (Column 1, Line 64 through Column 2 Line 40).
7. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified system disclosed by Shomura with the information disclosed by Ishikawa et al. to arrive at an output means for outputting torque or rotation speed change amount determined by the computation means as an index value that indicates the degree of intake air amount variation in the particular

Art Unit: 3747

cylinder, with the purpose in mind of adjusting the intake air in accordance with the torque variation (Ishikawa, Col. 2, line 36-41).

8. Furthermore, Shomura/Ishikawa et al. do not disclose the comparison and judgment means as set forth in the claims.

9. However, Mashiki discloses

a. comparison means for comparing a predetermined reference value with the amount of a change that occurs when the injection amount control means changes the fuel injection amount from the injection amount for stoichiometric operation (Column 10, Lines 58-63; and Column 14, Lines 5-26));

b. and judgment means, which, when comparing the change to the reference value, judges that a permissible level is exceeded by the air intake amount variations among the cylinders (Column 10, Line 65 through Column 11, Line 17).

10. The examiner notes that Mashiki compares the predetermined reference value ($dI_{nv} - C1$) to the amount of change that occurred (dI_n), and judges that a permissible torque variation is exceeded as evidenced by the subsequent change in fuel injection amount (Column 11, Lines 15-17). As has already been discussed, Ishikawa discloses that it is common knowledge in the art that excess torque variation is linked to air intake variation, thus in judging that excess torque variation has been exceeded, Mashiki judges that a permissible level of intake air amount variation is exceeded.

11. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Shomura/Ishikawa with the

Art Unit: 3747

system disclosed by Mashiki in order to make adjustments to the fuel injection amount only when an excessive amount of air amount variation among cylinders occurs.

12. Shomura/Ishikawa/Mashiki do not disclose the conversion means as set forth in the claims.

13. However Sugiyama et al. disclose a control system with the claimed conversion means for converting the intake air amount variations among the cylinders to intake valve operating angle variations among the cylinders and/or intake valve lift amount variations among the cylinders (Column 1, Lines 44-55)

14. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system disclosed by Shomura/Ishikawa/Mashiki with the operating angle conversion means disclosed by Sugiyama et al in order to accurately adjust the intake air amounts in each cylinder of the engine.

15. In re Claim 26, Shomura discloses:

- a. first injection amount control means for changing the fuel injection amount for a particular one of the cylinders from an injection amount for stoichiometric operation to an increased amount (Fig. 1, item 23, Column 7, Lines 36-43, and Lines 54-62)
- b. output means for outputting the torque or rotation speed change amount determined by the first computation means and the torque or rotation speed change amount determined by the second computation means as index values

Art Unit: 3747

that indicate the degree of intake air amount variation in the particular cylinder
(see claim 1 rejection above)

16. Shomura does not disclose:

- a. first computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the first injection amount control means
- b. second injection amount control means, which, when the torque or rotation speed change amount determined by the first computation means is not greater than a predetermined reference value, decreases the fuel injection amount for the particular cylinder from the injection amount for stoichiometric operation
- c. second computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the second injection amount control means (

17. However, Mashiki discloses:

- a. first computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the first injection amount control means (Column 9, Lines 54-58)
- b. second injection amount control means, which, when the torque or rotation speed change amount determined by the first computation means is not greater than a predetermined reference value, decreases the fuel injection amount for

Art Unit: 3747

the particular cylinder from the injection amount for stoichiometric operation
(Column 10, Line 58 through Column 11, Line 17)

c. second computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the second injection amount control means
(Column 9, Lines 22-29)

18. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified system disclosed by Shomura with the invention disclosed by Mashiki to arrive at the current invention.

19. Furthermore, Shomura/Ishikawa et al. do not disclose the comparison and judgment means as set forth in the claim.

20. However, Mashiki discloses

a. comparison means for comparing a predetermined reference value with the amount of a change that occurs when the injection amount control means changes the fuel injection amount from the injection amount for stoichiometric operation (Column 10, Lines 58-63);

b. and judgment means, which, when comparing the change to the reference value, judges that a permissible level is exceeded by the air intake amount variations among the cylinders (Column 10, Line 65 through Column 11, Line 17).

21. The examiner notes that Mashiki compares the predetermined reference value ($d_{Inv} - C1$) to the amount of change that occurred (d_{In}), and judges that a permissible

Art Unit: 3747

torque variation is exceeded as evidenced by the subsequent change in fuel injection amount (Column 11, Lines 15-17). As has already been discussed, Ishikawa discloses that it is common knowledge in the art that excess torque variation is linked to air intake variation, thus in judging that excess torque variation has been exceeded, Mashiki judges that a permissible level of intake air amount variation is exceeded.

22. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Shomura/Ishikawa with the system disclosed by Mashiki in order to make adjustments to the fuel injection amount only when an excessive amount of air amount variation among cylinders occurs.

23. In Re Claim 27, Shomura discloses

- a. An injection amount control unit for changing a fuel injection amount from an injection amount for stoichiometric operation to either an increased amount or a decreased amount in a particular cylinder, or on an individual cylinder basis (Column 5, Lines 24-26, and Column 7, Lines 17-30)
- b. A computation unit for determining on an individual cylinder basis the amount of a torque or rotation speed change that occurs when the fuel injection amount is changed by the injection amount control means in a particular cylinder, or on an individual cylinder basis (Column 8, Lines 10-14)
- c. An output unit for outputting the torque or rotation speed change amount determined by the computation unit as an index value that indicates the degree of intake air amount variations among the cylinders (Column 14, Lines 38-67)

Art Unit: 3747

24. Shomura does not disclose the comparison and judgment units as set forth in the claim.

25. However, Mashiki discloses

a. a comparison unit for comparing a predetermined reference value with the amount of a change that occurs when the injection amount control means changes the fuel injection amount from the injection amount for stoichiometric operation (Column 10, Lines 58-63);

b. and a judgment unit, which, when comparing the change to the reference value, judges that a permissible level is exceeded by the air intake amount variations among the cylinders (Column 10, Line 65 through Column 11, Line 17).

26. The examiner notes that Mashiki compares the predetermined reference value ($d_{inv} - C1$) to the amount of change that occurred (d_{in}), and judges that a permissible torque variation is exceeded as evidenced by the subsequent change in fuel injection amount (Column 11, Lines 15-17). As has already been discussed, Ishikawa discloses that it is common knowledge in the art that excess torque variation is linked to air intake variation, thus in judging that excess torque variation has been exceeded, Mashiki judges that a permissible level of intake air amount variation is exceeded.

27. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Shomura/Ishikawa with the system disclosed by Mashiki in order to make adjustments to the fuel injection amount only when an excessive amount of air amount variation among cylinders occurs.

Art Unit: 3747

28. In Re claim 28, Shomura discloses:

- a. first injection amount control unit for changing the fuel injection amount for a particular one of the cylinders from an injection amount for stoichiometric operation to an increased amount (Column 5, Lines 24-26, and Column 7, Lines 17-30)
- b. output unit for outputting the torque or rotation speed change amount determined by the first computation means and the torque or rotation speed change amount determined by the second computation means as index values that indicate the degree of intake air amount variation in the particular cylinder (Column 14, Lines 38-67)

29. Shomura does not disclose:

- a. first computation unit for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the first injection amount control means
- b. second injection amount control unit, which, when the torque or rotation speed change amount determined by the first computation means is not greater than a predetermined reference value, decreases the fuel injection amount for the particular cylinder from the injection amount for stoichiometric operation
- c. second computation unit for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the second injection amount control means (

30. However, Mashiki discloses:

Art Unit: 3747

- a. first computation unit for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the first injection amount control means (Column 8, Lines 60-65)
- b. second injection amount control unit, which, when the torque or rotation speed change amount determined by the first computation means is not greater than a predetermined reference value, decreases the fuel injection amount for the particular cylinder from the injection amount for stoichiometric operation (Column 8, Lines 38-42)
- c. second computation unit for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the second injection amount control means (Column 8, Lines 60-65)
- d. a comparison unit for comparing a predetermined reference value with the amount of a change that occurs when the injection amount control means changes the fuel injection amount from the injection amount for stoichiometric operation (Column 10, Lines 58-63);
- e. a judgment unit, which, when comparing the change to the reference value, judges that a permissible level is exceeded by the air intake amount variations among the cylinders (Column 10, Line 65 through Column 11, Line 17).

Art Unit: 3747

31. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified system disclosed by Shomura with the invention disclosed by Mashiki to arrive at the current invention.

32. Shomura/Ishikawa/Mashiki do not disclose the conversion means as set forth in the claims.

33. However Sugiyama et al. disclose a control system with the claimed conversion means for converting the intake air amount variations among the cylinders to intake valve operating angle variations among the cylinders and/or intake valve lift amount variations among the cylinders (Column 1, Lines 44-55)

34. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system disclosed by Shomura/Ishikawa/Mashiki with the operating angle conversion means disclosed by Sugiyama et al in order to accurately adjust the intake air amounts in each cylinder of the engine.

Response to Arguments

35. Applicant's arguments filed 12/09/2009 have been fully considered but they are not persuasive..

36. In response to the argument that Shomura does not change the fuel injection amount for a particular one of the cylinders, the examiner disagrees, as the changing of

Art Unit: 3747

the fuel amount in every cylinder within the engine would inherently result in a changing fuel amount in any "particular" cylinder of the engine. In regards to the operation of the applicant's invention set forth in the specification, the applicant is reminded that the specification is not read into the claims, and as currently set forth, the claims lack sufficient specificity to overcome the prior art.

Conclusion

37. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **SIZO B. VILAKAZI** whose telephone number is (571)270-3926. The examiner can normally be reached on M-F: 10:00am-5:00pm.

Art Unit: 3747

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen K. Cronin can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SIZO B VILAKAZI/
Examiner, Art Unit 3747

/Stephen K. Cronin/
Supervisory Patent Examiner, Art Unit 3747